

Listing of Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1. (Currently Amended) A feed horn adapted to direct microwave radiation toward a reflector, comprising a horn portion having an end aperture and an interior surface portion defining an exponential taper converging inwardly and an elongated dielectric rod portion substantially centered with respect to said horn portion and having an elongated tapered end part extending in the direction of the end aperture, the relative lengths and other characteristics of said rod portion and said horn portion being configured such that said horn portion is the primary determinant of the radiation characteristics in a first band of frequencies and said dielectric rod is the primary determinant of the radiation characteristics in a second band of frequencies.
2. (Previously Presented) The feed horn of claim 1 wherein said horn has a generally cylindrical metallic interior surface portion which extends from said exponential taper and substantially encloses the tapered part of said dielectric rod portion, such that a free end of the rod portion is substantially coextensive with the plane of said aperture of said horn.
3. (Original) The feed horn of claim 2 wherein said interior surface portion having an exponential taper converges inwardly to an input bore of the horn portion.

4. (Original) The feed horn of claim 1 wherein said exponential taper begins and extends inwardly of said horn aperture, and wherein said dielectric rod tapered end part extends outwardly beyond said aperture.

5. (Previously Presented) The feed horn of claim 1 wherein the dielectric rod tapered end part extends such that said horn portion is substantially in a radiation shadow of the dielectric rod portion.

6. (Currently Amended) A feed horn adapted to direct microwave radiation toward a reflector ~~which produces a symmetrical radiation pattern and has a substantially constant phase center over a wide frequency range,~~ said feed horn comprising:

a horn portion having an end aperture and an interior surface portion defining an exponential taper converging inwardly and an elongated dielectric rod portion having a dielectric constant, said rod portion being substantially centered with respect to said horn portion and having an elongated tapered end part extending in the direction of the end aperture, said dielectric rod portion being free of any surrounding dielectric material having a second dielectric constant different from said first dielectric constant.

7. (Original) The feed horn of claim 6 wherein said exponential taper begins and extends inwardly of said horn aperture, and wherein said dielectric rod tapered end part extends outwardly beyond said aperture.

8. (Previously Presented) The feed horn of claim 6 wherein the dielectric rod tapered end part extends such that said horn portion is substantially in a radiation shadow of the dielectric rod portion.

9. (Currently Amended) The feed horn of claim 6 wherein said frequency range is ~~in~~ from about 12 GHz to about 30 GHz.

10. (Original) The feed horn of claim 6 wherein said frequency range is from about 5 GHz to about 7 GHz.

11. (Currently Amended) A method of transmitting or receiving electromagnetic radiation using a feed horn assembly adapted to direct microwave radiation toward a reflector, said method comprising:

producing a ~~symmetrical~~ radiation pattern ~~having a substantially constant phase center over a wide frequency range~~, using a horn portion having an end aperture and an interior surface portion defining an exponential taper converging inwardly and an elongated dielectric rod portion with a first dielectric constant substantially centered with respect to said horn portion and having an elongated tapered end part extending in the direction of the ~~end horn~~ aperture portion, said dielectric rod portion being free of any surrounding dielectric material having a second dielectric constant different from said first dielectric constant.

12. (Previously Presented) The method of claim 11 wherein said horn has a generally cylindrical metallic interior surface portion which extends from said exponential taper and substantially encloses the tapered part of said dielectric rod, such that a free end of the rod portion is substantially coextensive with the plane of said aperture of said horn.

13. (Original) The method of claim 12 wherein said interior surface portion having an exponential taper converges inwardly to an input bore of the horn portion

14. (Original) The method of claim 11 wherein said exponential taper begins and extends inwardly of said horn aperture, and wherein said dielectric rod tapered end part extends outwardly beyond said aperture.

15. (Previously Presented) The method of claim 11 wherein the dielectric rod tapered end part extends such that said horn portion is substantially in a radiation shadow of the dielectric rod portion.

16. (New) An antenna assembly, comprising:

a reflector; and

a feed horn adapted to direct microwave radiation toward said reflector, the feed horn comprising a horn portion having an end aperture and an interior surface portion defining an exponential taper converging inwardly and an elongated dielectric rod portion substantially centered with respect to said horn portion and having an

elongated tapered end part extending in the direction of the end aperture, the relative lengths and other characteristics of said rod portion and said horn portion being configured such that said horn portion is the primary determinant of the radiation characteristics in a first band of frequencies and said dielectric rod is the primary determinant of the radiation characteristics in a second band of frequencies.

17. (New) An antenna assembly, comprising:

a reflector; and

a feed horn adapted to direct microwave radiation toward said reflector, comprising a horn portion having an end aperture and an interior surface portion defining an exponential taper converging inwardly and an elongated dielectric rod portion having a dielectric constant substantially centered with respect to said horn portion and having an elongated tapered end part extending in the direction of the end aperture, said dielectric rod portion being free of any surrounding dielectric material having a second dielectric constant different from said first dielectric constant.